

WHAT IS CLAIMED IS:

1. An anti-howling circuit for use in an environment having a first transducer for converting a received signal to acoustic output, a second transducer for converting acoustic input to an outgoing signal, and an adaptive echo canceler for generating a predicted echo signal from the received signal by multiplying samples of the received signal by respective tap coefficients, subtracting the predicted echo signal from the outgoing signal to generate a residual signal, and adaptively updating the tap coefficients, wherein the anti-howling circuit detects howling according to an effect of the predicted echo signal.
2. The anti-howling circuit of claim 1, further comprising an attenuating circuit for attenuating the residual signal when howling is detected.
3. The anti-howling circuit of claim 1, further comprising an initializing circuit for initializing the tap coefficients when howling is detected.
4. The anti-howling circuit of claim 1, comprising:
 - a first envelope detector for detecting a first envelope of the outgoing signal;
 - a second envelope detector for detecting a second envelope of the residual signal; and
 - a decision circuit for comparing the first envelope with the second envelope, thereby detecting howling.
5. The anti-howling circuit of claim 4, wherein the first envelope and the second envelope are power envelopes.
6. The anti-howling circuit of claim 4, wherein the

decision unit detects howling when the second envelope exceeds the first envelope by at least a predetermined ratio.

7. The anti-howling circuit of claim 4, further comprising an echo loss calculator for calculating echo attenuation on an echo path from the received signal to the outgoing signal.

8. The anti-howling circuit of claim 7, wherein the decision unit detects howling when the second envelope exceeds the first envelope by a threshold ratio that depends on the calculated echo attenuation on the echo path.

9. The anti-howling circuit of claim 8, wherein the threshold ratio increases as the calculated echo attenuation increases.

10. The anti-howling circuit of claim 1, comprising:
a first envelope detector for detecting a first envelope of the received signal;
a second envelope detector for detecting a second envelope of the residual signal; and
a decision circuit for comparing the first envelope with the second envelope, thereby detecting howling.

11. The anti-howling circuit of claim 10, wherein the first envelope and the second envelope are power envelopes.

12. The anti-howling circuit of claim 10, wherein the decision unit detects howling when the second envelope exceeds the first envelope by at least a predetermined ratio.

13. A method of detecting howling in an environment having a first transducer for converting a received signal to acoustic output, a second transducer for converting acoustic

input to an outgoing signal, and an adaptive echo canceler for generating a predicted echo signal from the received signal by multiplying samples of the received signal by respective tap coefficients, subtracting the predicted echo signal from the outgoing signal to generate a residual signal, and adaptively updating the tap coefficients, the method including detecting an effect of the predicted echo signal.

14. The method of claim 13, wherein the detected effect of the predicted echo signal depends on the magnitude or polarity of the predicted echo signal.

15. The method of claim 13, wherein the effect of the predicted echo signal is detected by:
detecting a first envelope of the outgoing signal;
detecting a second envelope of the residual signal; and
comparing the first envelope with the second envelope.

16. The method of claim 13, wherein the effect of the predicted echo signal is detected by:
detecting a first envelope of the received signal;
detecting a second envelope of the residual signal; and
comparing the first envelope with the second envelope.

17. The method of claim 13, further including:
detecting an echo attenuation on an echo path from the received signal to the outgoing signal; and
altering a condition for detection of howling according to the detected echo attenuation, the condition becoming more stringent as the detected echo attenuation increases.